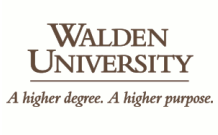

2019

Evaluation of a Postpartum Hemorrhage Protocol

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This is to certify that the doctoral study by

Lori Davies

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2019

Abstract

Evaluation of a Postpartum Hemorrhage Protocol

by

Lori M. Davies

MSN, Walden University, 2010

BSN, Shepherd College, 1994

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2019

Abstract

Postpartum hemorrhage is a leading cause of maternal death, yet many deaths related to hemorrhage might be prevented with early recognition and intervention. The birthing unit of a U.S. community hospital formed an interprofessional task force to plan and implement a postpartum hemorrhage protocol that would provide the obstetric team with the knowledge, skills, and tools needed for early identification and quick action when hemorrhage occurred. Lewin's model of change provided a framework for protocol implementation. The purpose of this doctoral project was to evaluate this quality improvement project. Secondary data internal to the organization were collected and analyzed to answer the practice-focused question, Is there a relationship between implementation of a postpartum hemorrhage protocol and the incidence of postpartum hemorrhage? To determine the incidence of postpartum hemorrhage, the number of hemorrhages with and without blood transfusion was divided by the number of deliveries and recorded monthly. The chi-square test was used to analyze the rates of hemorrhage pre- and post-implementation. A statistically significant decrease in hemorrhage was noted post-implementation, suggesting that there was a relationship between implementation of a protocol and the incidence of postpartum hemorrhage. This project supported the Walden University mission by working towards optimal health outcomes for women. Eliminating preventable harm related to hemorrhage benefits women, families, and communities. Lessons learned from the implementation and evaluation of this quality improvement project are expected to be utilized by nursing leaders to address other challenges identified in the obstetric setting.

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Dedication

This work is dedicated to my husband, Richard, and daughter, Elizabeth, for their ongoing support of my academic pursuits. I would have never reached the milestone of earning a Doctor of Nursing Practice without their love and encouragement. Thank you!

Acknowledgments

Without the ongoing support of many people, this work would have never been possible. Thank you to Stoerm Anderson, PhD, for his guidance throughout my Walden journey. His wisdom and advice proved to be invaluable. Thank you to Margaret McNeill, PhD, RN, APRN-CNS, CCRN-K, CCNS, TCRN, CPAN, NE-BE, NHDP-BC, FCNS, FAAN. Dr. McNeill is an accomplished nurse and role model. I have benefitted from her continued guidance and mentoring.

I am grateful to the dedicated performance improvement specialist who assisted with data collection for this scholarly project. I could not have finished this work without her and her willingness to go above and beyond to provide the needed data. I am appreciative of the director of Women's and Children's Services for challenging her team to always look for the next best thing. Finally, to the Postpartum Hemorrhage Task Force and the members of the Obstetric Team, I am grateful to have had the opportunity to work with a dedicated group of health professionals who are willing to change their practice to improve the quality and safety of care provided to our mothers and babies.

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Section 1: Nature of the Project

Introduction

Postpartum hemorrhage occurs in approximately 3% of all deliveries in the United States. Each year, hemorrhage is the cause of one fourth of the deaths related to childbirth worldwide and 12% of the maternal deaths in the United States (Evensen, Anderson, & Fontaine, 2017). More than half of all deaths related to hemorrhage are preventable (Bingham, Lyndon, & Lagrew, 2011). Many postpartum hemorrhages could be avoided with early recognition of excessive blood loss and prompt interventions to control bleeding. Additionally, rates of blood transfusion to treat women experiencing a postpartum hemorrhage have increased by 33% since 2001 (Patterson et al., 2014). In July 2015, Main et al. published a consensus statement simultaneously in multiple professional journals aimed at obstetricians, midwives, anesthesiologists and nurses, outlining clinical practices for prevention and treatment that should be implemented in every facility providing maternity services (Main et al., 2015). A written postpartum hemorrhage protocol that addresses four elements--readiness, recognition, response, and reporting--was advocated by the authors of the statement (Main et al., 2015).

In 2016, as part of my Doctor of Nursing Practice (DNP) program of study, I led an interprofessional task force in the planning and implementation of a postpartum hemorrhage protocol. The mission of the quality improvement project was to promote the well-being of women, infants, and families by eliminating preventable harm in the newly delivered woman through implementation of a postpartum hemorrhage protocol.

Evaluation of the previously implemented postpartum hemorrhage protocol was the focus of this DNP project.

Many individuals, including nurses who provide obstetrical care, are surprised to learn that the United States is the only developed nation that has experienced an increase in mortality and morbidity related to pregnancy and childbirth over the past two decades (Agrawal, 2015). Even though more resources are allotted to health care in the United States than in any other developed nation, there is a need to change practices to improve the safety and quality of care provided to pregnant and newly delivered women (Creanga et al., 2014). Although the incidence of death related to pregnancy has decreased globally, the United States continues to rank poorly in terms of maternal mortality as compared to other developed countries (World Health Organization, 2018). Because the well-being of mothers, infants, and children determines the health of the next generation and can help predict the future challenges faced by families, communities, and the medical care system, efforts are required to improve maternal outcomes (HealthyPeople.gov, 2017). In Section 1, I state the Doctor of Nursing Practice project problem and purpose, define the nature of the project, and discuss the significance of the problem.

Problem Statement

Approximately 700 women die every year in the United States due from complications related to pregnancy and childbirth (Centers for Disease Control and Prevention, 2019). More than half of these deaths could be prevented with early recognition and response (World Health Organization, 2018). Obstetric hemorrhage is a

leading cause of maternal mortality and morbidity in the United States. Mortality is said to be the "tip of the iceberg," and for every woman who dies of causes related to pregnancy, 20 or 30 other pregnant or newly delivered women will experience serious short-term or long-term health consequences (Tabassam et al., 2013).

In 2015, a state-wide initiative designed to eliminate preventable harm resulting from hospitalization identified the medium-sized community hospital in this project as having a higher observed to expected ratio of postpartum hemorrhage that required medical interventions such as blood transfusion as compared to other hospitals of similar size. In this state, postpartum hemorrhage was considered a preventable hospital-acquired condition and a portion of the organization's reimbursement was at risk if actions were not taken to decrease the incidence of postpartum hemorrhage (Maryland Hospital Association, 2015). In addition to the primary mission of improving maternal outcomes, the risk of loss of reimbursement served as a financial incentive to implement a postpartum hemorrhage protocol. In October 2015, nursing leadership formed an interprofessional task force to design a postpartum hemorrhage protocol. As a perinatal clinical nurse specialist, I facilitated the activities of this task force. The protocol provided the nurses, physicians, and support staff that comprise the obstetric team with the knowledge, skills, behaviors, and tools needed for early recognition and rapid intervention in the newly delivered woman to prevent mortality and morbidity. Full implementation of the protocol elements was completed in late 2016. The initial design failed to identify a formal plan for evaluating the efficacy of the postpartum hemorrhage

protocol. The lack of a plan for evaluating the previously implemented protocol was the problem addressed by this DNP project.

Purpose Statement

The purpose of this DNP scholarly project was to evaluate a previously implemented quality improvement project. A statewide quality improvement initiative identified the hospital as having a higher incidence of postpartum hemorrhage for a hospital its size which could have a potential financial impact, the senior leadership of the organization mandated that measures be put into place to decrease the incidence of postpartum hemorrhage. As providers of healthcare to vulnerable populations, the obstetric team was motivated to plan and implement a protocol aimed at eliminating preventable harm in newly delivered women. A review of the current literature revealed that birthing units across the United States were establishing protocols to address postpartum hemorrhage (Bingham, Lyndon, Lagrew, & Main, 2011).

Maternal hemorrhage is a low-volume, high-risk event. Nurses do not encounter postpartum hemorrhage frequently in their practice, yet when they do, they are expected to intervene quickly and effectively to prevent adverse maternal outcomes. A protocol provides an organized approach to hemorrhage management that can be taught to nurses and other members of the health care team and reinforced with simulation training (Lutgendorf et al., 2017).

Nature of the Doctoral Project

This DNP project addresses the practice-focused question, Is there a relationship between the implementation of a postpartum hemorrhage protocol and the incidence of

postpartum hemorrhage? The quality improvement project targeted the obstetric team providing care to pregnant and newly delivered women in a community hospital setting. The protocol includes a standardized method for assessing hemorrhage risk for all obstetrical patients, and stage-based guidelines based on quantified blood loss (QBL) provide action steps for communication and intervention when bleeding is heavier than expected.

Implementation of the postpartum hemorrhage protocol began in early 2016, and all elements of the protocol were fully implemented by December 31, 2016. Elements of the postpartum hemorrhage protocol include the implementation of a hemorrhage risk assessment of the woman on admission to the Labor and Delivery unit, with each nursing handoff, and any time a change in patient status occurred. Quantification of blood loss through weight and measure replaced the traditional estimation of blood loss. All blood-soaked items are weighed and measured; then, dry weights of items are subtracted to determine weight in grams. One gram of weight is equal to 1 ml of blood loss. Current literature indicates that estimated blood loss is subjective and may not truly reflect the degree of blood loss by the newly delivered woman. Quantified blood loss has been found to be an objective and effective method for communicating the degree of blood loss to the obstetric team. The protocol also includes staged-based guidelines based on QBL that direct the interventions of the obstetric team. In collaboration with the pharmacist, the interprofessional planning team assembled a postpartum hemorrhage medication kit. The medication kit was placed in all medication-dispensing machines located on the birthing unit. The planning team created an emergency cart that included

supplies and equipment needed for management of a postpartum hemorrhage. As part of the protocol, the medication kit and hemorrhage cart are brought to the patient care area when hemorrhage is known or suspected. Following a hemorrhage on the birthing unit, a team huddle is conducted to debrief on which aspects of managing the hemorrhage went well; to identify opportunities for improvement; and to assess whether additional personnel, equipment, or supplies would have been useful in managing the patient experiencing a hemorrhage. A standardized form is utilized by the team to guide debriefing of the event. Revisions to the protocol are made based on feedback from the obstetric team.

To evaluate the effectiveness of the postpartum hemorrhage protocol and to answer the practice question, I compared the rate of monthly hemorrhages for the 24 months prior to protocol implementation (January 2014 - December 2015) to the rate of monthly hemorrhages in the 24-month period after implementation (January 2017 – December 2018) to identify any relationships between protocol implementation, which occurred in 2016, and incidence of hemorrhage. In addition to the incidence of the postpartum hemorrhages, I reviewed the following complications related to hemorrhage during the identified periods: number of transfusions and types of blood products, incidence of peripartum hysterectomy, admissions to the Intensive Care Unit, and maternal death.

I used secondary data internal to the organization to answer the practice question. The organization’s Performance Improvement (PI) Department reported the number of postpartum hemorrhages with and without blood transfusion monthly. The hospital’s

Labor and Delivery unit reported the number of deliveries per month (vaginal and cesarean).

Significance

Formal evaluation is necessary to measure effectiveness of a program and to determine if resources are efficiently utilized (Centers for Disease Control and Prevention, 2012). Evaluation of the postpartum hemorrhage protocol was useful in determining if the quality improvement goals of prevention and early recognition with rapid response by the obstetric team were achieved and in identifying opportunities for improvement. Stakeholders who participated in protocol development represented the disciplines of medicine and nursing as well as representatives from the PI Department, the information technology department, pharmacy, and the blood bank. Task force members were key to protocol planning and implementation. A formal plan for program evaluation was not part of original design; I completed one for this DNP project.

The mission of Walden University is to provide a diverse community of career professionals with the opportunity to transform themselves as scholar practitioners to effect positive social change (Walden University, 2017). This evaluation of a quality improvement project supported the Walden mission by working towards optimal health outcomes for mothers and babies. Women are considered the cornerstone of a healthy and prosperous world populations (Association of Women's Health, Obstetric and Neonatal Nursing [AWHONN], 2017). Quality improvement projects designed to improve the health of women can eliminate preventable mortality and morbidity and therefore benefit families, communities, and populations (AWHONN], 2017). The postpartum hemorrhage

protocol was intended to improve outcomes in all women cared for on this birthing unit. A quality improvement effort can be enhanced by applying evaluation results to future program development and revision (Moore et al., 2014). The evaluation findings of this evidence-based practice project may be applied to other challenges identified in the obstetric setting and throughout the organization.

Summary

In summary, in this section I presented the practice problem of an increase in maternal mortality and morbidity related to hemorrhage and the demand for a comprehensive postpartum hemorrhage protocol. I clarified the local need to evaluate the implemented protocol. The purpose of the practice project was briefly discussed, and the practice-focused questions presented. The nature of the doctoral project was identified, the sources of evidence introduced, and potential implications for social change proposed. In Section 2, I will address the background and context for the performance improvement project.

Section 2: Background and Context

Introduction

Globally, hemorrhage in the newly delivered woman is a leading cause of maternal mortality and morbidity (World Health Organization, 2018). More than half of all deaths related to hemorrhage could be prevented with early identification and prompt intervention (Bingham, Lyndon, Lagrew, & Main, 2011). In 2015, Main et al. published a consensus statement recommending that facilities offering maternity services have a written protocol for rapid recognition and response when blood loss related to pregnancy and childbirth is greater than expected (Main et al., 2015). Also, in 2015, a statewide quality improvement initiative identified this medium-sized community hospital as having a higher incidence of postpartum hemorrhage than was expected for a hospital of its size. The organization had no written protocol for the prevention and intervention for postpartum hemorrhage. A gap in practice was identified, and a nurse-led interprofessional task force was formed to plan and implement a postpartum hemorrhage protocol. The purpose of this DNP project was to conduct an evaluation of the implemented protocol.

Concepts, Models, and Theories

AIM Framework: Readiness, Recognition, Response, and Reporting

The framework utilized in the planning and implementation of the postpartum hemorrhage protocol was developed by the Alliance for Innovation for Women's Health (AIM). AIM is a national data-driven maternal safety and quality improvement initiative based on proven implementation approaches reporting (Council on Patient Safety in

Women's Health Care, 2018). In early 2016, AIM convened an interdisciplinary team to address opportunities for improving the delivery of maternity care (Kleppel, Suplee, Stuebe, & Bingham, 2016). The AIM-supported patient safety bundles provide a framework for quality improvement in maternal health care. The AIM postpartum hemorrhage bundle provides 13 action steps framed in the four domains of readiness, recognition, response, and reporting (Council on Patient Safety in Women's Health Care, 2018). The bundle draws from several evidence-based guidelines and can be modified as necessary to match the resources of the local birthing unit.

Lewin's Model of Change

Implementing the postpartum hemorrhage protocol required significant changes in practice by the obstetric team. Planning for change is an important strategy for the successful implementation of a quality improvement initiative. To manage protocol implementation, the planning task force utilized Lewin's model of change. Lewin, a social psychologist, used an analogy of melting and refreezing a block of ice into a new shape to explain his theory of change (Shirey, 2013). The theory has three stages; first, unfreezing occurs when the need for change is identified and those who will be affected are prepared for the change (Evans, Ball, & Wicher, 2016). The second stage of the theory, transitioning, requires movement towards a new way of being (Evans et al., 2016). During this stage, forces that push the team in the desired direction must be balanced with restraining forces that hinder change (Evans et al., 2016). In the third stage, refreezing, the change becomes stabilized and the desired change is maintained (Zaccagnini & White, 2011).

In the first, or unfreezing stage, members of the obstetric team needed to understand the need for a change in process. A state-wide initiative designed to eliminate preventable harm resulting from hospitalization had identified the organization as having a higher incidence of postpartum hemorrhage than was expected for a hospital of its size. When the team realized that the incidence of hemorrhage was high, they were motivated to make changes to improve outcomes for the women they cared for. Creating a sense of urgency for change and selecting a solution is part of the unfreezing process (Shirey, 2013). Helping the team to realize the benefits of implementing a postpartum hemorrhage protocol was important in the unfreezing stage (see Evans et al., 2016). Education regarding the protocol was key to preparing staff for the change and was accomplished through bulletin boards, computer learning modules, and one-on-one sessions.

In the second stage of Lewin's theory, moving or transitioning, change is viewed as a process rather than an event (Shirey, 2013). In this stage, it is important to give people time to learn and adopt the elements of the change being made. The postpartum hemorrhage protocol was implemented in phases. The first strategy of protocol implementation was the roll out of QBL in vaginal deliveries. The initial process was revised based on team feedback and deemed effective. The next strategy was to implement QBL in cesarean deliveries. After QBL was routine practice in all deliveries, the planning task force employed the stage-based guidelines based on QBL. In collaboration with the pharmacist, the task force created a postpartum hemorrhage medication kit and made it readily available. The task force assembled a cart that contained supplies need to manage a hemorrhage emergency. The task force implemented

a hemorrhage risk assessment tool that was available in the electronic medical record to allow for determining level of risk throughout the intrapartum period.

Finally, in the refreezing stage, the postpartum hemorrhage protocol was fully implemented and became part of the unit's culture of safety. In the refreezing stage, there was risk that the obstetric team would not comply with the protocol and revert to past behaviors (see Shirey, 2013). For the 6 months following full implementation of the protocol, the planning task force conducted audits of patient records to ensure that QBL totals and risk assessments were documented appropriately in all deliveries. When hemorrhage occurs, debriefs are conducted to determine strengths and opportunities of the protocols. Edits are made based on team feedback. To reinforce learning, simulation training is conducted annually to assess staff's ability to recognize and respond when excessive bleeding occurs.

Relevance to Nursing Practice

I conducted a review of the current literature to locate published sources of information on postpartum hemorrhage protocols. Databases searched included Cumulative Index of Nursing and Allied Health Literature (CINAHL), CINAHL and MEDLINE Combined Search, ProQuest, and Allied Health Source, along with Google Scholar. I used peer-reviewed articles published between 2010 and 2018. Some older articles were included if they portrayed historic relevance to the topic under consideration. Key search terms included postpartum hemorrhage, maternal mortality and morbidity, nursing theory, protocols, and program evaluation. The Boolean operators

AND, OR, and NOT were used to further define the search. The following is a brief overview of findings related to specific topics relevant to the DNP practice project.

Postpartum Hemorrhage and Maternal Mortality and Morbidity

Hemorrhage can occur at any time during pregnancy, but the highest risk is immediately after birth. The most commonly accepted definition of postpartum hemorrhage is greater than 500 ml of blood loss in a vaginal delivery and greater than 1000 ml of blood loss in a cesarean section (Borovac-Pinheiro et al., 2018). Uterine atony is the failure of the uterus muscle to contract firmly after the birth of the baby and is the leading cause of postpartum hemorrhage, accounting for approximately 80% of all cases (D'Alton et al., 2017). In patients with uterine atony, blood loss can be significant. Less common causes of postpartum hemorrhage include trauma to the genital tract, retained tissue, and maternal coagulopathies (Marshall et al., 2017).

Hemorrhage may be prevented by identifying those at risk and providing active management of the third stage of labor. Active management of the third stage of labor includes administration of oxytocin (Pitocin) with delivery of the neonate, controlled cord traction to deliver the placenta, and vigorous uterine massage after the delivery of the placenta (Evensen, Anderson, & Fontaine, 2017). Early recognition and interventions such as increased surveillance, administering uterotonic medications, and continued fundal massage when heavy bleeding occurs can decrease the incidence of postpartum hemorrhage (D'Alton et al., 2017). Interventions for severe hemorrhage include transfusion of blood products, surgical procedures including peripartum hysterectomy, and admission to the intensive care unit (Shields, Wisner, Fulton, & Pelletreau, 2015).

The best way to prevent serious complications of postpartum hemorrhage is to be prepared when it occurs. Implementing a risk assessment, using QBL, adopting a protocol, and having a team in place can improve maternal outcomes when hemorrhage happens (D'Alton et al., 2017).

Protocols

Protocols in health care are locally agreed upon standards that guide nursing assessment, intervention, and documentation. Protocols consist of systematically developed criteria that help nurses make decisions about appropriate care of the patient (Arora et al., 2016). Nurses who care for pregnant women need a systematic approach to delivering maternal resuscitation and managing obstetric emergencies (Green, Rider, Ratcliff, & Woodring, 2015). Standardized clinical protocols are intended to allow for an organized method to address a condition to reduce the risk of serious mistakes and eliminate preventable harm (Simpson, 2018). Protocols should be used when the potential exists for variations in practice that could impact outcomes. Protocols facilitate standardization of care and decrease variation in practice. Eliminating variation in practice and performing critical tasks the same way every time can reduce the kinds of errors that all human beings are subject to when rare and stressful events occur on the obstetric unit (ACOG, 2017).

Local Background and Context

As blood loss is inevitable during labor and birth, it is essential to have a method for reliably identifying and communicating the amount of blood loss and a plan for intervention when higher than expected bleeding occurs. Prior to the implementation of

the protocol, a pregnant woman's risk for hemorrhage was not routinely assessed and there were no established guidelines for nursing intervention when bleeding was greater than expected. Common practice in the obstetrical setting before the protocol was to visually estimate blood loss. Key aspects of the postpartum hemorrhage protocol include assessment of hemorrhage risk for all pregnant and newly delivered patients, QBL through weighing and measuring, and stage-based guidelines for intervention based on QBL. With implementation of the protocol, assessment of hemorrhage risk is completed by the patient's nurse upon admission to the birthing unit, with each shift assessment, with every change in patient status, and following childbirth. Quantification of blood loss begins with the delivery of the placenta and presents a more accurate assessment of the patient's clinical picture than estimated blood loss (AWHONN, 2015). Guidelines based on QBL totals direct interventions and facilitate appropriate communication when excessive bleeding occurs. Following a postpartum hemorrhage, the team discusses the event and provides real-time feedback on strengths and opportunities of the protocol. Interprofessional education regarding the elements of the protocol was delivered to learners through computer-based learning modules, electronic messages, one-on-one interaction, and simulation training.

The hospital in which this DNP project was implemented is a 298-bed acute care hospital located in the eastern United States. It is a private, non-stock, not for profit 501 (c) (3) corporation organized in 1897. The organization was surveyed by the Joint Commission in October 2017 and has recently applied for Magnet status. The obstetrical department comprises the labor and delivery unit, the postpartum unit and the Neonatal

Intensive Care Unit. The department manages approximately 2400 deliveries per year with a 30% cesarean section rate. Labor and Delivery nurses collaborate with the providers to care for the laboring woman and are trained to circulate and recover vaginal and cesarean births. Following delivery, the patient remains on the labor unit for two hours after the delivery of the placenta and is then transferred to the postpartum unit for 2-4 days of recovery, dependent on mode of delivery. The postpartum hemorrhage protocol is applicable to all women cared for on the labor and delivery and postpartum units. Both units practice complete couplet care, meaning that mothers and newborns always remain together unless there is a medical or safety reason to separate them.

Role of the DNP student

I have been employed by the organization in which the postpartum hemorrhage protocol was implemented for over 20 years in various roles, primarily on the labor and delivery unit. As a DNP student and clinical nurse specialist on the perinatal unit, my focus is the quality and safety of care provided to patients by the obstetric team. I am frequently involved with multidisciplinary teams that collaborate on evidence-based practice projects. I facilitate the activities of the Obstetric Hemorrhage Task Force that planned and implemented the postpartum hemorrhage protocol. I was shocked to learn that maternal mortality is higher in the United States than in any other developed nation. I am passionate about the care provided to women and children and felt the need to act locally to decrease the risks of morbidity and mortality related to hemorrhage. It was a privilege to be a part of the task force that planned and implemented the protocol. On a regular basis, I see nurses that are now aware of patients at risk for hemorrhage,

recognize when bleeding in the newly delivered woman is greater than expected and know how to intervene to prevent hemorrhage. With knowledge, skills, and tools that were established through the protocol implementation, these nurses have the ability to respond quickly when hemorrhage occurs to improve maternal outcomes.

The DNP prepared nurse translates evidence-based knowledge into practice and serves as an agent for change. As a clinical nurse specialist and DNP student, I am aware of the importance of evaluating an evidence-based practice project. A weakness of the original implementation of the postpartum hemorrhage protocol was a lack of a formal plan for evaluation. I have learned while on my Walden journey that a strong program evaluation plan supports accountability while allowing planners to gain useful knowledge about their program and to sustain ongoing development. Program evaluation helps to determine if goals and objectives are being met, if resources are being allotted effectively, and if reproducible change is being created. Data collection is essential and to determine effectiveness of a program, the data must be aggregated, analyzed, and reported to inform stakeholders as to whether objectives have been met and positive social change created because of the program (Kettner, Moroney, & Martin, 2017). This is the reason that the effectiveness of the postpartum hemorrhage protocol is the focus of my DNP project.

Role of the Project Team

The development of this protocol was an interprofessional collaborative effort. Interprofessional collaboration occurs when two or more individuals or groups work together to accomplish a common goal (Green & Johnson, 2013). Establishing

interprofessional teams to address complex issues is becoming a norm in health care. Collaboration among professionals provides a means for teams to accomplish more than could be achieved by an individual.

Key stakeholders from the disciplines of medicine and nursing as well as the PI Department, the information technology department, and the blood bank were members of the Obstetric Hemorrhage Task Force. Bedside nurses who provide direct patient care were important contributors to the project as they were most affected by changes in practice dictated by the protocol. Involving a physician champion facilitated physician acceptance to any proposed changes in the management of postpartum hemorrhage. The performance improvement specialist assisted the team in data gathering. A representative from the blood bank contributed information regarding policies and procedures for requesting and issuing blood products that may be required for treating hemorrhage. As implementation of the protocol necessitated changes to the electronic medical record, an information technology representative was involved in the collaborative effort. Nurse managers were important contributors to the project as they were involved in decision-making regarding the allocation of resources and personnel.

Interprofessional collaboration has been related to both greater responsiveness to patients and efficient use of resources (Kvarnstrom, 2008) and can encourage new ways of thinking to arrive at new solutions to old problems (Green & Johnson, 2013). The successful implementation and evaluation of this project will be applied to other challenges identified in the obstetric setting. Utilizing interprofessional teams, additional protocols might be developed to address other patient safety issues.

Summary

In section 2 of this paper, I presented the model and theories that informed the planning and implementation of the postpartum hemorrhage protocol, the relevance to nursing practice identified, and the local background and context of the project described. I discussed the role of the DNP student in project development as well as personal motivations. Finally, I described the role of the team in protocol implementation and the importance of interprofessional collaboration to improve patient outcomes. In Section 3, I will present the methods for data collection and analysis of the evidence.

Section 3: Collection and Analysis of Evidence

Introduction

Death from postpartum hemorrhage is largely preventable with quick identification and rapid intervention. A written protocol to guide nursing practice is therefore recommended for all facilities that provide birthing services (Shields et al., 2015). A state-wide initiative designed to eliminate preventable harm resulting from hospitalization identified this medium-sized community hospital as having a higher observed to expected ratio of postpartum hemorrhage as compared to other hospitals of similar size. Hospital leadership mandated action, and an interdisciplinary task force involving nurses, providers, and support staff who were passionate about improving maternal outcomes for mothers was formed to plan and implement a postpartum hemorrhage protocol. The protocol was designed to provide the obstetric team with the knowledge, skills, and tools needed for consistent recognition and standardized response when higher than anticipated blood loss occurs in the newly delivered woman. In this DNP project, I evaluated the effectiveness of this protocol utilizing secondary data provided by the organization. The purpose of Section 3 is to identify the sources of evidence used and to discuss how the analysis and synthesis of secondary data was conducted.

Practice-Focused Question

The United States is the only developed nation that has seen an increase in maternal mortality. Postpartum hemorrhage is a leading cause of death in newly delivered women (Main et al., 2017). A review of the current literature indicated that more than

half of all maternal deaths related to hemorrhage could be prevented when excessive bleeding is recognized quickly and prompt action is taken to restore hemostasis (Dahlke et al., 2015). In order to facilitate early recognition and response, facilities that provide birthing services are advised to implement a postpartum hemorrhage protocol that outlines management strategies to be implemented based on QBL (Main et al. 2014). A statewide quality improvement initiative noted that this birthing unit had a higher observed incidence of postpartum hemorrhage than expected for a hospital of its size. Nursing practice needed to change in order to improve maternal outcomes. As a result, an interprofessional task force was formed to plan, develop, and implement a postpartum hemorrhage protocol.

Evaluation of the previously implemented protocol was the purpose of this DNP project. I used secondary data internal to the organization to answer the practice-focused question, Is there a relationship between the implementation of a postpartum hemorrhage protocol and the incidence of postpartum hemorrhage? Implementation of a protocol that utilizes QBL, stage-based guidelines, and team preparation for response can improve maternal outcomes when hemorrhage occurs (Shields et al., 2015).

Sources of Evidence

Evaluating the success of protocol implementation is important to determine effectiveness and to identify opportunities for improvement. The purpose of the postpartum hemorrhage protocol was to provide the obstetric team with the knowledge, skills, and tools needed for rapid identification of excessive bleeding and prompt response to improve maternal outcomes. The interprofessional task force that planned and

implemented the protocol anticipated that, following protocol implementation, a reduction in the overall incidence of hemorrhage, a decrease in the number of blood transfusion required as a result of hemorrhage, and a reduction of negative maternal outcomes associated with severe hemorrhage would be realized. For this program evaluation, I compared patient outcomes pre- and post-implementation to determine the effectiveness of the postpartum hemorrhage protocol. Outcomes evaluated were the rate of hemorrhage with and without blood transfusion, the incidence of transfusion, and the number and type of blood products required. Additional outcome measures included the incidence of peripartum hysterectomy, admission to the Intensive Care Unit, and maternal death related to hemorrhage.

Archival and Operational Data

I used secondary data internal to the organization that are routinely collected to answer the practice-focused question. The majority of data used to evaluate the postpartum hemorrhage protocol were collected and provided by the organization's PI Department. According to hospital records, the PI Department regularly monitors compliance with evidence-based processes known to enhance positive outcomes, evaluates performance, and identifies opportunities to improve reliability and excellence. The PI Department provides a monthly report of the number of postpartum hemorrhages with and without transfusion. The labor and delivery unit reports the total number of deliveries per month and the mode of delivery (vaginal or cesarean). The rate of hemorrhage was determined by dividing the number of hemorrhages by the number of deliveries. A comparison was made between the rate of monthly hemorrhages for the 24

months prior to protocol implementation (January 2014 – December 2015) to the rate of monthly hemorrhages in a 24-month period after implementation (January 2017 – December 2018) to identify any relationships between protocol implementation and incidence of hemorrhage.

When a patient is identified as having a hemorrhage, in my role as the perinatal clinical nurse specialist, I reviewed the patient's electronic medical record to determine if transfusion of blood products related to hemorrhage is required and if so I recorded the amount and type of blood products transfused. Additionally, the PI Department provides data regarding the number of peripartum hysterectomies, admissions to the Intensive Care Unit, and maternal deaths that occur in the organization. I used this information supplied by the PI Department to compare pre- and post-implementation data.

Analysis and Synthesis

Implementing the postpartum hemorrhage protocol required a change in nursing practice. Lewin's (1947) change model provided a framework for this DNP project and played a role in the selection of time periods to be used for data analysis. According to Lewin's theory, change occurs when the change agents proceed through three stages, unfreezing, moving, and refreezing. Unfreezing occurs when those affected by the change must recognize the need (Mitchell, 2013). A statewide initiative that linked health care quality to reimbursement identified this birthing unit as having a higher observed incidence of postpartum hemorrhage than expected for a hospital of its size. An interprofessional task force was formed to design, plan, and implement a protocol to

decrease the incidence of postpartum hemorrhage. The postpartum hemorrhage task force began meeting on a monthly basis in June 2015.

In Lewin's second stage, moving occurs when change is initiated (Mitchell, 2013). Protocol design and planning was intensive and involved a staged implementation. Initial strategies included staff education regarding stage-based hemorrhage guidelines and QBL through weight and measurements beginning with delivery of the placenta were implemented beginning in February 2016. All elements of the protocol were implemented by June 2016.

Lewin's final stage of change is refreezing, during which equilibrium is established (Shirey, 2013). Refreezing occurred over a period of 6 months. By December 2016, the obstetric team had successfully incorporated the strategies of the protocol into daily practice. To evaluate the implemented protocol, I compared the preimplementation period of January 2014 through December 2015 with the post-implementation period of January 2017 through December 2018, to determine if a relationship existed between the implementation of a protocol and the incidence of postpartum hemorrhage. The incidence of complications associated with severe hemorrhage, transfusion of blood products, peripartum hysterectomy, admission to the Intensive Care Unit, and maternal death related to hemorrhage were also compared pre- and post-implementation.

For data analysis, I compared two 24-month periods, (January 2014 - December 2015 and January 2017 - December 2018). All data were entered into SPSS 24.0. Descriptive analysis of all the process and outcome variables was completed to examine the data for outliers and missing data. Percentages were calculated for categorical

variables. I used the chi-square test to analyze differences in categorical variables. All patient information related to this project was deidentified to protect patient health information.

Summary

The purpose of the DNP project was to evaluate a previously implemented postpartum hemorrhage protocol. In Section 3, I restated the practice focused question, clarified the sources of evidence, and outlined the plan for analysis and synthesis of data. In Section 4, findings, implications, and recommendations are presented.

Section 4: Findings and Recommendations

Introduction

The United States has experienced an increase in maternal mortality over the past two decades, despite spending more on health care than any other developed nation (Arora et al, 2016). Practices must change in order to improve outcomes for pregnant and postpartum women. Hemorrhage is a leading cause of maternal death and morbidity (Main et al., 2015). More than half of all deaths related to hemorrhage can be prevented with early recognition and prompt intervention. In 2015, a statewide initiative to decrease hospital acquired harm identified this community hospital was noted as having a higher incidence of postpartum hemorrhage than was expected for an organization of its size. An interprofessional task force formed to plan and implement a postpartum hemorrhage protocol designed to provide the obstetric team with the knowledge, skills, and tools they needed to identify and act when a woman was experiencing excessive blood loss. A formal evaluation of the postpartum hemorrhage protocol was not included in the original project design. The purpose of this DNP project was to evaluate the previously implemented quality improvement project and to answer the practice-focused question, Is there a relationship between the implementation of a postpartum hemorrhage protocol and the incidence of postpartum hemorrhage?

Implementation of the postpartum hemorrhage protocol began in early 2016, and all elements of the protocol were fully implemented and incorporated into practice by December 31, 2016. Components of the postpartum hemorrhage protocol included implementation of an assessment tool to assess a woman’s hemorrhage risk on

admission to the Labor and Delivery unit, with each nursing handoff, and with any change in patient status. QBL through weight and measure replaced the traditional estimation of blood loss. Beginning with delivery of the placenta, all blood-soaked items are weighed and measured; then, dry weights of items are subtracted to determine weight in grams. One gram of weight is equal to 1 ml of blood loss. Current literature indicates that estimated blood loss is subjective and may not truly reflect the degree of blood loss by the newly delivered woman (AWHONN, 2017). QBL has been shown to be an objective and effective method for communicating the degree of blood loss to the obstetric team (AWHONN, 2017).

The protocol also includes guidelines based on QBL that direct the interventions of the obstetric team. In collaboration with the pharmacist, the planning task force developed a postpartum hemorrhage medication kit. The medication kit is available in all medication dispensing machines located on the birthing unit. A postpartum hemorrhage cart was developed that included supplies and equipment needed for management of a postpartum hemorrhage. The protocol dictates that the medication kit and hemorrhage cart are brought to the patient care area when hemorrhage is known or suspected. Following a hemorrhage on the birthing unit, a team huddle is conducted to debrief on which aspects of managing the hemorrhage went well; to identify opportunities for improvement; and to assess whether additional personnel, equipment, or supplies would have been useful in managing the patient experiencing a hemorrhage. Revisions to the protocol are made based on feedback from the obstetric team.

To conduct an evaluation of the effectiveness of the postpartum hemorrhage protocol and to answer the practice question, I compared the rate of monthly hemorrhages for the 24 months prior to protocol implementation (January 2014 - December 2015) to the rate of monthly hemorrhages in the 24-month period after implementation (January 2017 – December 2018), to identify any relationships between protocol implementation, which occurred in 2016, and incidence of hemorrhage. In addition to the incidence of the postpartum hemorrhages, I reviewed the following complications related to hemorrhage during the identified periods: number of transfusions and types of blood products, incidence of peripartum hysterectomy, admissions to the Intensive Care Unit, and maternal death.

I used secondary data internal to the organization to answer the practice question. The number of deliveries during the evaluation period was obtained from the Labor and Delivery unit, which tracks and reports birth rates on a monthly basis. The PI Department tracks and reports the incidence of postpartum hemorrhage and number of postpartum hemorrhages requiring blood transfusion on a monthly basis. Following approval by the Institutional Review Boards of Walden University and the organization, I conducted a retrospective review of the electronic health record to determine if patients identified as having a postpartum hemorrhage required transfusion of blood products. If transfusion was required, the type and quantity of blood products was recorded.

Additionally, the PI Department tracks and reports maternal complications such as peripartum hysterectomy, admission to the Intensive Care Unit, and maternal deaths. Only patients with peripartum hysterectomies, admission to the Intensive Care Unit, and

death who were identified as having hemorrhages were included in this evaluation of the quality improvement project.

Findings and Implications

I performed statistical analysis to answer the study question, Is there a relationship between the implementation of a postpartum hemorrhage protocol and the incidence of postpartum hemorrhage? Further analysis was completed to determine if implementation of a postpartum hemorrhage protocol resulted in a decrease in the incidence of postpartum hemorrhage requiring blood transfusion, the number and type of blood products transfused, peripartum hysterectomy, admission to the Intensive Care Unit, and maternal death.

For data analysis, I compared two 24-month periods (January 2014 to December 2015 and January 2017 to December 2018). All relevant data were entered into SPSS 24.0 for analysis. I completed a descriptive analysis of the variables, all categorical, and examined them for missing data. I calculated percentages for postpartum hemorrhages and hemorrhages requiring transfusion. I used the chi-square test to analyze the difference in the incidence of postpartum hemorrhage and the difference in the incidence of postpartum hemorrhages that required blood transfusion preimplementation compared to post-implementation. I compared the type and number of blood products transfused pre- and post-implementation. I analyzed peripartum hysterectomy and admission to the Intensive Care Unit using the Fisher's exact test.

Postpartum Hemorrhage as Percentage of Monthly Deliveries

During the evaluation period of January 2014 through December 2018, 11,984 women gave birth at this community hospital. To determine the rate of postpartum hemorrhages as a percentage of monthly deliveries, I divided the number of reported postpartum hemorrhages by the number of deliveries in that month. Figure 1 displays these findings.

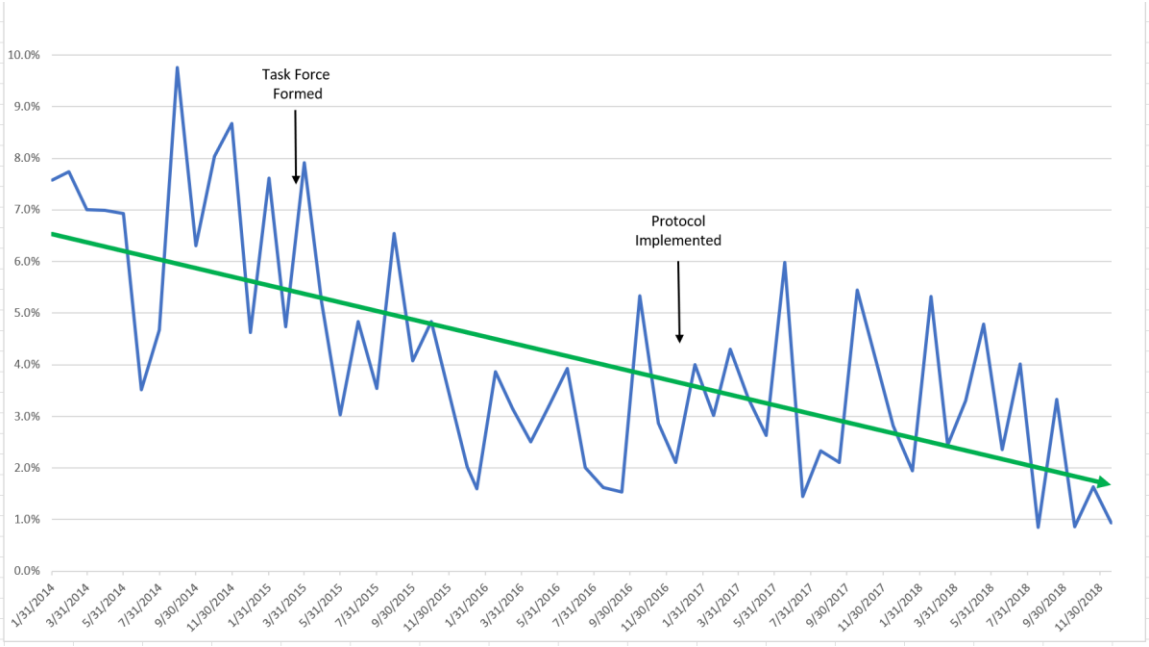

Figure 1. Incidence of postpartum hemorrhage as a percentage of monthly deliveries.

Difference in Postpartum Hemorrhage Pre- and Postprotocol Implementation

I analyzed the percentage of postpartum hemorrhage in the preimplementation group (n = 4766) and the post-implementation group (n = 4781). The preimplementation group had a postpartum hemorrhage percentage of 5.8, and the post-implementation

group had a percentage of 3.0. I used the chi-square test to test the difference in percentage of postpartum hemorrhage in the groups. I rejected the null hypothesis, X^2 (1) = 44.03, $p \leq 0.001$. This evaluation finding answers the study question that there is a relationship between the incidence of postpartum hemorrhage and the implementation of a postpartum hemorrhage protocol. The percentage of postpartum hemorrhage in the post-implementation group was less than in the preimplementation group and the decrease was statistically significant.

Difference in Postpartum Hemorrhage Requiring Blood Transfusion Pre- and Postprotocol Intervention

I analyzed the percentage of postpartum hemorrhages that required blood transfusion by comparing data from the preimplementation group (n=4766) and the post-implementation group (n=4781). The preimplementation group had a percentage of postpartum hemorrhage with transfusion of 0.7 while the post-implementation group had a percentage of 0.6. I used the chi square test to test the difference in percentages of postpartum hemorrhage with transfusion in the groups. I accepted null hypothesis, X^2 (1) = 0.02, p = 0.89. While the rate of hemorrhage related to childbirth decreased significantly overall, the incidence of postpartum hemorrhage that required transfusion only minimally decreased and the difference was not statistically significant.

Number and Types of Blood Products Transfused Pre- and Postintervention

A total of 123 units were transfused in delivered women who required blood products as a result of postpartum hemorrhage in the preimplementation group as compared to the post-implementation group, who were transfused with a total of 111

units. Table 1 shows the number and type for each unit transfused. As anticipated, a decrease in the total number of units transfused following the implementation of the postpartum hemorrhage protocol occurred. This evaluation finding suggests that while there was a minimal decrease in the number of hemorrhages requiring transfusion, fewer units of blood products were needed to treat hemorrhage following implementation of the postpartum hemorrhage protocol.

Table 1

Numbers and Types of Blood Products Transfused Pre- and Postintervention

Stage	Total units transfused	Units			
		Red blood cells	Platelet	Plasma	Cryoprecipitate
Preimplementation	123	88	7	20	8
Postintervention	111	99	4	14	0

Comparison of Peripartum Hysterectomy, Admissions to the Intensive Care Unit, and Maternal Mortality

Serious complications of postpartum hemorrhage are common, even in high resource countries (Evenson, Anderson, & Fontaine, 2017). Table 2 details the number of complications of severe hemorrhage that occurred during the evaluation period. Serious complications included peripartum hysterectomy and admission to the ICU.

While there was a decrease in the number of peripartum hysterectomies performed post-implementation, the number of admissions to the ICU increased in the post-implementation period. I used Fisher's exact test to test the association of the protocol with peripartum hysterectomies and ICU admission because of small cell sizes. Analysis of peripartum hysterectomy before (n = 3) and after (n = 2) the intervention

showed no significant difference ($P = 0.69$ by Fisher's exact test). Analysis of ICU admission before ($n = 3$) and after ($n = 6$) the intervention also showed no significant difference ($P = 0.51$ by Fisher's exact test). No maternal deaths related to hemorrhage occurred during the evaluation period.

Table 2

Incidence of Peripartum Hysterectomy, Admission to the Intensive Care Unit, and Maternal Death Pre- and Postintervention

Stage	Peripartum hysterectomy	Admission to the ICU	Maternal deaths
Preimplementation	3	3	0
Postintervention	2	6	0

Discussion

A statewide initiative that linked health care quality to reimbursement identified this birthing unit as having a higher observed incidence of postpartum hemorrhage than expected for a hospital of its size. Hospital leadership directed action to avoid a negative financial impact to the organization. The obstetric team was motivated to make changes that would positively impact maternal safety. An interprofessional task force was formed and this group planned and implemented an evidence-based postpartum hemorrhage protocol.

The intent of the protocol was to provide the care team with a standardized management approach for the patient experiencing excessive blood loss to improve maternal outcomes. The expected outcomes of protocol implementation were a decrease in the incidence of postpartum hemorrhage, a decrease in the need for blood transfusions,

and decrease in the number of complications related to severe postpartum hemorrhage (admissions to the ICU, peripartum hysterectomy, and maternal death). The findings of this evaluation validated the perception of the task force that a relationship exists between the implementation of an evidence-based protocol and the incidence of postpartum hemorrhage. Figure 1 indicates a downward trend in the number of postpartum hemorrhages as a percentage of monthly deliveries.

A sudden decline in the incidence of postpartum hemorrhage coincided with the recognition and communication of the problem to the obstetric team. One explanation for the decrease in the incidence of postpartum hemorrhage prior to intervention may be attributed to the Hawthorne or observation effect. The Hawthorne effect is the change in behavior that occurs when people know that they are being observed. The Hawthorne effect has been increasingly accepted as a potential confounder in research studies involving any form of observation (McCambridge, Witton, & Elbourne, 2014). A systematic review by Choi, Jung, and Gratcharov (2019) indicated that the Hawthorne effect does exist among health care professionals and may lead to changes in practice. It is reasonable to attribute the initial decrease in the incidence of postpartum hemorrhage to an increased awareness that a problem existed and to the expectation of improved outcomes related to hemorrhage by hospital leadership. Due to increased awareness, nurses may have been more observant of blood loss in the postpartum period and communicated their concerns to the providers earlier. As a result, providers may have implemented management strategies earlier and more consistently leading to an initial decrease in incidence of postpartum hemorrhage prior to implementation of the protocol.

The decrease in the incidence of postpartum hemorrhage accelerated after formation of the interdisciplinary task force, further implying that knowledge of the problem brought about increased awareness and changes in practice even prior to the full implementation of the protocol. The Hawthorne effect tends to diminish over time as observation is decreased or stopped (Choi, Chung, & Gratcharov, 2019). If the decrease in postpartum hemorrhage was related to the Hawthorne effect, it is expected that the decline in hemorrhages would level off or the incidence of hemorrhage would even increase over time. While rates of hemorrhage differ monthly, a consistent downward trend in the incidence of hemorrhage since the implementation and hardwiring of a postpartum hemorrhage protocol continued in this organization.

Evidence-based protocols can facilitate measurable improvements in the quality of care and can aid in timely diagnosis and treatment to prevent or limit the severity of morbidity (Arora et al., 2016). The Joint Commission recommended the adoption of protocols to address maternal mortality and morbidity (Shields et al., 2015). The interprofessional group tasked with protocol planning and implementation used aspects of existing protocols retrieved from the current literature to develop an evidence-based postpartum hemorrhage protocol to improve outcomes. While it is not possible to attribute the implementation of a protocol to be the cause of the decrease in postpartum hemorrhage, it is reasonable to propose from analysis of the data that a relationship exists between implementation of the protocol and the incidence of postpartum hemorrhage as evidenced by a statistically significant decrease in the incidence of postpartum hemorrhage post-implementation.

The decrease in hemorrhages with transfusion was statistically insignificant. However, the total number of units of blood products required to treat postpartum hemorrhage decreased from 123 units preimplementation to 111 units post-implementation. This finding suggests that early recognition and intervention may decrease the number of units of blood products required to treat severe hemorrhage. Additionally, during the period of time studied, an increased emphasis on appropriate blood utilization occurred within the organization which may have impacted transfusion practices.

During the evaluation period, there was an increase in ICU admissions (3 preimplementation versus 6 post-implementation), although this finding was statistically insignificant. This increase may be related to a heightened awareness of serious hemorrhage by obstetrical care providers. A higher level of awareness may have increased the likelihood of transfer to a critical setting.

In the United States, the maternity population increasingly mirrors the general population in that women are more likely to be of advanced maternal age, have a higher body mass index, and have a rising prevalence of comorbid medical conditions (Arora et al., 2016). The rise in admissions to the ICU may be related to a higher complexity of the obstetric patient that increases hemorrhage risk. No maternal deaths related to hemorrhage occurred during the evaluation period.

There are many variables that could not be controlled for that may have contributed to the improved outcome seen after protocol implementation. The ability to attribute cause and effect when the elements of control and randomization are missing is

limited. Also, a protocol that includes a bundle of interventions makes it impossible to identify which ones are actually effective. Nonetheless, the observed improvements support the continued practice of the protocol.

Recommendations

Findings of this evaluation suggest that the implementation of a postpartum hemorrhage protocol that provided a standardized management approach were related to the overall decrease in the incidence of hemorrhage. The current literature identifies protocols as quality improvement processes that can positively impact patient outcomes. Recommendations resulting from this evaluation of a quality improvement project include continuing with the current practice of ongoing risk assessment, quantification of blood loss, and the use of stage-based guidelines when excessive bleeding occurs; conducting post-hemorrhage debriefs to garner valuable information from the team; and ongoing data collection and analysis to identify trends and opportunities for improvement.

While the overall incidence of postpartum hemorrhage decreased in the post-implementation period, there was only a small decrease in hemorrhages that required transfusion. While these numbers were very low, further study is recommended to identify strategies to decrease the incidence of severe hemorrhages that require transfusion. This evaluation finding suggests that there is a need for further study of severe hemorrhages to identify effective prevention and intervention strategies.

Each member of the obstetric team participates in postpartum hemorrhage simulation annually as part of the unit's competency marathon. Obstetrics is an area that

has utilized simulation to develop team behaviors and for practicing unusual events that require quick intervention to achieve the best possible patient outcomes. It is recommended that this practice continues as simulation allows the opportunity to practice skills in a safe environment where no harm to patients can occur if mistakes are made (Abersold & Tschannen, 2013).

Contribution of the Doctoral Project Team

This DNP student in the role of perinatal clinical nurse ppecialist coordinated the activities of the interprofessional task force that planned and implemented a postpartum hemorrhage protocol designed to provide the care team with the knowledge, skills, and supplies needed to recognize and respond when excessive bleeding occurred in the newly delivered woman. The project team included physicians, nurse managers, clinical nurses, and support personnel from the areas of information technology, performance improvement, pharmacy, and the blood bank. Involving key stakeholders (those who would be most affected by the implementation of the protocol) in the planning process ensured that the protocol would address the concerns of all members of the obstetric team.

Lessons learned by this protocol implementation will guide other efforts to improve maternal outcomes. Members of the task force were engaged and involved in all aspects of the planning and implementation of the postpartum hemorrhage protocol. Evaluation of the protocol indicates a statistically significant decrease in the incidence of postpartum hemorrhage in the post-implementation period implying that the interprofessional task force was effective in their efforts to improve outcomes for

pregnant and newly delivered women. Interprofessional planning teams will be formed to address other patient safety issues.

Strengths and Limitations of the Project

Strengths of this evaluation of a previously implemented postpartum hemorrhage protocol include length of evaluation period and sample size. Five years of data were reviewed for this project (January 2015 through December 2018), providing a clear picture of the situation before, during, and after the implementation of the protocol. During the evaluation period, 11,984 women gave birth at this community hospital (4766 preimplementation and 4781 post-implementation) providing a sufficient sample size to identify the impact of the postpartum hemorrhage protocol. As previously stated, this was a quality improvement project and not a research study with an experimental design. Controls and randomization were not present, therefore, confounding factors ma have contributed to the observed outcomes.

An identified limitation of the postpartum hemorrhage protocol is generalizability to another patient population. The postpartum hemorrhage task force identified protocol elements found in the nursing literature and adapted them to meet the needs of this community hospital. While implementation of the protocol was shown to result in a statistically significant decrease in the incidence of postpartum hemorrhage, it may not be effectively applied to another patient population.

Section 5: Dissemination Plan

Plan for Dissemination of Evaluation Findings

New information uncovered by a clinical initiative or research study has little meaning by itself. Its impact comes when it is shared with others. Knowledge and clinical wisdom are advanced when nurses share information on the programs they develop or studies they conduct (Bingham & O'Neal, 2013). I led an interprofessional task force in planning and implementing a postpartum hemorrhage protocol in a community hospital that was identified as having a higher incidence of hemorrhage than was expected for a birthing unit of its size. There was a local need to change practice to improve maternal outcomes. Additionally, due to a state-wide initiative to eliminate preventable hospital acquired harm, the high incidence of postpartum hemorrhage would have a negative financial impact on the organization. To develop the protocol, the task force reviewed the current literature and developed a stage-based protocol to provide the obstetric team with the knowledge, skills, and supplies needed to quickly recognize and intervene when blood loss was excessive in the newly delivered woman. A formal evaluation plan was not included in the original project design. However, it became evident that evaluation was necessary to determine if implementation of the protocol achieved the desired results of decreased incidence of postpartum hemorrhages.

The purpose of this DNP project was to answer the study question, Is there a relationship between the implementation of a postpartum hemorrhage protocol and the incidence of postpartum hemorrhage? The formal evaluation process revealed a statistically significant decrease in the incidence of postpartum hemorrhage following the

implementation of the protocol. As maternal mortality is rising in the United States and hemorrhage is a major cause of pregnancy-related death (Borovac-Pinheiro et al., 2018) there is an obligation to disseminate the results of this DNP project both internally and externally to the organization in order to add new knowledge that contributes to an improvement in maternal outcomes.

Internal Dissemination

In addition to the primary mission of improving maternal outcomes, the potential loss of reimbursement served as a financial incentive to implement a postpartum hemorrhage protocol in this organization. Hospital leadership supported the efforts to decrease the incidence of postpartum hemorrhage. Key stakeholders who were involved in planning and implementing the postpartum hemorrhage protocol included physicians, nurse managers, clinical nurses, and support personnel from the areas of information technology, performance improvement, pharmacy, and the blood bank. To inform key stakeholders of the statistically significant decrease in hemorrhages after the implementation of the postpartum hemorrhage protocol, I will share the findings of this evaluation in meetings of the organization's Clinical Leadership Team, the Department of Obstetrics and Gynecology, as well as staff meetings on the birthing unit. The format for dissemination will be an oral presentation accompanied by a slideshow utilizing graphs and tables to demonstrate results. I will submit an article for the in-house newsletter to communicate the impact of the postpartum hemorrhage protocol to nurses and other hospital personnel.

External Dissemination

DNP capstone projects can be valuable sources of information; in addition, they have the potential to improve nursing practice and may be advantageous to others in specific nursing specialty areas (Carter-Templeton, 2015). Two methods for disseminating information external to the organization include publishing an article in a professional journal and presenting a poster at a national nursing conference. To disseminate the findings of this evaluation of an evidence-based postpartum hemorrhage protocol to nursing colleagues, I plan to submit a manuscript to an AWHONN peer-reviewed journal. AWHONN is a nursing membership organization that promotes the health of women, infants, and children (AWHONN, 2019). The appropriate outlet for the dissemination of this evaluation of a quality improvement project is AWHONN's publication, *Nursing for Women's Health*, a clinical practice journal whose mission is to improve outcomes for women and newborns through the dissemination of clinical scholarship (AWHONN, 2019). By disseminating the results of this evaluation of a postpartum hemorrhage protocol through *Nursing for Women's Health*, clinical nurses in other settings might benefit from this organization's quality improvement effort.

In addition, I plan to submit an abstract for a poster presentation at the 2020 AWHONN National Convention. Reducing maternal mortality is a topic to be addressed at the convention. A poster presentation should be an effective way to present the evaluation results of this quality improvement project that addressed a leading cause of maternal death to like-minded nursing professionals. In addition to presenting evaluation findings, the poster session will allow the opportunity to meet and interact with

conference attendees in order to expand on aspects of implementing a postpartum hemorrhage protocol.

Analysis of Self

The mission of Walden University is to provide a diverse community of career professionals with the opportunity to transform themselves as scholar practitioners to effect positive social change (Walden University, 2017). This quality improvement project supports the Walden mission by working towards optimal health outcomes for mothers and babies. Women are considered the cornerstone of a healthy and prosperous world (AWHONN, 2017). As such, quality improvement projects that seek to improve the health of women by eliminating preventable mortality and morbidity may benefit families, communities, and populations (AWHONN, 2017). I am passionate about the health of women and children and have spent the majority of my professional career seeking opportunities to improve the quality and safety of nursing care provided to vulnerable groups. I have grown personally and professionally throughout my Walden journey. Knowledge gained through my coursework allowed me to effectively lead an interprofessional task force through the process of planning and implementing a postpartum hemorrhage protocol.

Perhaps the most valuable lesson learned from this DNP project is the importance of program evaluation. A formal evaluation plan should be included in the initial project planning phase. Without an evaluation plan, it is impossible to determine if program goals were met and if resources were effectively used. I learned that data collection and analysis were essential to determining if the implementation of this quality improvement

initiative affected maternal outcomes. A quality improvement effort can be enhanced by applying evaluation results to future program development and revision (Moore et al., 2014). The successful implementation and findings of the evaluation of this evidence-based practice project will be applied to other challenges identified in the obstetric setting and throughout the organization.

I gained a richer understanding of the role of the DNP-prepared nurse and the opportunities I have as a scholar-practitioner to facilitate positive change in the patient population served, in my organization and within my profession. As a DNP student, I have acquired valuable knowledge that I have applied to my practice throughout the Walden journey. As a DNP-prepared nurse, I will use this knowledge to positively impact care provided to women, children, and families.

Summary

The United States is the only developed nation that has experienced an increase in maternal mortality and morbidity despite allocating more resources to health care than any other country (Creanga et al., 2014). Opportunity exists to change practice in order to improve outcomes for pregnant and newly delivered women (Creanga et al., 2014). Postpartum hemorrhage is a leading cause of maternal death, and more than half of maternal deaths related to hemorrhage could be prevented with rapid recognition and response by health care providers (Bingham, Scheich, Byfield, Wilson, & Bateman, 2016). This medium-sized community hospital was identified as having a higher incidence of postpartum hemorrhage than expected for an organization of its size. An interprofessional task force was formed to plan and implement a postpartum hemorrhage

protocol to provide the obstetric team with the knowledge, skills, and supplies needed to quickly identify and intervene when a woman was experiencing excessive bleeding after childbirth. A formal evaluation plan was not included in the original project design.

The purpose of this DNP project was to conduct an evaluation of a previously implemented quality improvement project to answer the study question, Is there a relationship between the implementation of a postpartum hemorrhage protocol and the incidence of postpartum hemorrhage? To evaluate the postpartum hemorrhage protocol and to answer the practice question, I compared the rate of monthly hemorrhages for the 24 months prior to the protocol implementation (January 2014 – December 2015) to the rate of monthly hemorrhage after the protocol implementation (January 2017 – December 2018) to identify any relationships between protocol implementation and the incidence of hemorrhage. Data analysis indicated that there was a statistically significant decrease in the incidence of postpartum hemorrhage post-implementation as compared to preimplementation of the protocol, indicating that this was related to the protocol. Insight and knowledge gained from conducting this evaluation of a postpartum hemorrhage protocol may be useful in planning future programs aimed at improving the quality and safety of care provided to women and children.

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